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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/759,786	01/15/2004	Peter Chambers	MIC-M096	8161

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PATENT LAW GROUP LLP
2635 NORTH FIRST STREET
SUITE 223
SAN JOSE, CA 95134

EXAMINER	
DO, CHAT C	
ART UNIT	**PAPER NUMBER**
2193	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/30/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/759,786	CHAMBERS ET AL.	
	Examiner	Art Unit	
	Chat C. Do	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *15 January 2004 and 21 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *01/15/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities:

The applicant is advised to update information cited under the "Cross-Reference to Related Application" section in page 1 of original specification.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1-21 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-21 disclose a method for performing a mathematical conversion of an input value to another output value wherein they are related as expressed equation. In order for claims to be statutory, claims must either include a practical/physical application or a concrete, useful, and tangible result. However, claims 1-21 merely disclose steps of performing mathematical conversion in hardware without expressively disclosing a practical application or a tangible result. Therefore, claims 1-21 are directed to non-statutory subject matter.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-5, 7-10, and 12-21 are rejected under 35 U.S.C. 102(b) as being anticipated by Kelly (U.S. 5,942,992).

Re claim 1, Kelly discloses in Figures 1-7 a device for performing numerical value conversion of a digital input value in a first unit to a second unit being a natural unit, the first unit being related to the second unit by a first equation (e.g. abstract and Figures 2), comprising: a look-up table (e.g. 214 in Figure 2A) storing a plurality of coefficients for performing the numerical value conversion from the first unit to the second unit, the look-up table being indexed using a first parameter to provide a selected coefficient (e.g. 210 and 212 in Figure 2A); and an arithmetic logic unit (e.g. 220 and 226 in Figure 2A) receiving the digital input value in the first unit and the selected coefficient from the look-up table (e.g. output 205B and coefficients A and B from the table in Figure 2A), the arithmetic logic unit (e.g. 220 and 226 in Figure 2A) performing the numerical value conversion based on the first equation and using the selected coefficient to compute a digital output value in the second unit (e.g. expression in 108 and 110 in Figure 1).

Re claim 2, Kelly further discloses in Figures 1-7 the first unit comprises an arbitrary unit and the second unit comprises a natural unit of physical measurement (e.g.

abstract wherein the first unit is measured unit value and the second unit is the engineering value).

Re claim 3, Kelly further discloses in Figures 1-7 the numerical value conversion from the arbitrary unit to the natural unit has a linear relationship described by the equation D.sub.N=m D.sub.A+c, where D.sub.A is the digital input value, D.sub.N is the digital output value, m is a slope coefficient and c is an offset coefficient, and the plurality of coefficients comprises a plurality of coefficient pairs, each coefficient pair comprising a slope coefficient and an offset coefficient (e.g. Figures 2A and 2B).

Re claim 4, Kelly further discloses in Figures 1-7 the numerical value conversion from the arbitrary unit to the natural unit has a non-linear relationship and the plurality of coefficients implements the numerical value conversion in a piecewise-linear fashion approximating the non-linear relationship (e.g. col. 1 lines 30-35 and col. 5 lines 32-39).

Re claim 5, Kelly further discloses in Figures 1-7 the look-up table stores the plurality of coefficients for a plurality of linear segments for performing the piecewise-linear numerical value conversion, each linear segment being described by the equation D.sub.N=m D.sub.A+c, where D.sub.A is the digital input value, D.sub.N is the digital output value, m is a slope coefficient and c is an offset coefficient for the respective linear segment, and the plurality of coefficients comprises a plurality of coefficient pairs, each coefficient pair comprising a slope coefficient and an offset coefficient for the respective linear segment (e.g. table 214 in Figure 2A and col. 5 lines 30-68).

Re claim 7, Kelly further discloses in Figures 1-7 digital input value comprises a digitized value in an arbitrary unit generated by an analog-to-digital converter and the

second unit comprises a natural unit of physical measurement (e.g. abstract and Figure 1 with steps 102 and 112).

Re claim 8, Kelly further discloses in Figures 1-7 the first parameter comprises a system operating condition associated with a system providing the digital input value (e.g. abstract and the last six lines of abstract as related to temperature).

Re claim 9, Kelly further discloses in Figures 1-7 the first parameter comprises an operating temperature associated with the system providing the digital input value and wherein each coefficient in the look-up table corresponds to an assigned range of the operating temperature (e.g. abstract, table 214 in Figure 2A and the last six lines of abstract as related to temperature).

Re claim 10, Kelly further discloses in Figures 1-7 the digital input value comprises an N-bit digital value and the first parameter comprises the most significant k bits of the digital input value where k is less than N (e.g. high order bits 208 in Figure 2A).

Re claim 12, Kelly further discloses in Figures 1-7 a multiplexor coupled to receive the first parameter and a second parameter, the multiplexor receiving a select signal for selecting one of the first parameter and the second parameter, wherein the look-up table is indexed by the selected one of the first and second parameters.

Re claim 13, it is a method claim of claim 1. Thus, claim 13 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 14, Kelly further discloses in Figures 1-7 indexing the look-up table using a first parameter to provide a selected coefficient comprises: selecting the first

parameter from a plurality of indexing parameters using a select input signal; and indexing the look-up table using the first parameter selected from the plurality of indexing parameters (e.g. 210, 212, and 214 in Figure 2A).

Re claim 15, it is a method claim of claim 2. Thus, claim 15 is also rejected under the same rationale as cited in the rejection of rejected claim 2.

Re claim 16, it is a method claim of claim 3. Thus, claim 16 is also rejected under the same rationale as cited in the rejection of rejected claim 3.

Re claim 17, it is a method claim of claim 4. Thus, claim 17 is also rejected under the same rationale as cited in the rejection of rejected claim 4.

Re claim 18, it is a method claim of claim 5. Thus, claim 18 is also rejected under the same rationale as cited in the rejection of rejected claim 5.

Re claim 19, it is a method claim of claim 8. Thus, claim 19 is also rejected under the same rationale as cited in the rejection of rejected claim 8.

Re claim 20, it is a method claim of claim 9. Thus, claim 20 is also rejected under the same rationale as cited in the rejection of rejected claim 9.

Re claim 21, it is a method claim of claim 10. Thus, claim 21 is also rejected under the same rationale as cited in the rejection of rejected claim 10.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being obvious over Kelly (U.S. 5,942,992).

Re claim 6, Kelly does not disclose in Figures 1-7 the non-linear relationship comprises a logarithmic relationship. However, Kelly does mention that the conversion is performed either linear or nonlinear in related to engineering conversion (e.g. abstract and col. 1). Further, the examiner takes an official notice that the logarithm conversion is well-known and widely used in engineering system. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add a logarithm relationship for conversion because it would enable to convert value into engineer's logarithm.

Re claim 11, Kelly further discloses in Figures 1-7 digital input value comprises a digitized voltage value in an arbitrary unit generated by an analog-to-digital converter (e.g. step 102 in Figure 1). Kelly fails to disclose the second unit comprises a Decibel unit. However, Kelly does mention that the conversion is performed either linear or nonlinear in related to engineering conversion (e.g. abstract and col. 1). Further, the examiner takes an official notice that the Decibel unit is well-known and widely used in engineering system for many practical application. Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add a Decibel unit because it would enable to convert value into engineer practical unit.

Double Patenting

7. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-5, 10, 13, and 20 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 6-10, 12, and 20 of copending Application No. 10/759,988. Although the conflicting claims are not identical, they are not patentably distinct from each other because

> Claims 1, 6-10, 12, and 20 of Application No. 10/759,988 contain every element of claims 1-5, 10, 13, and 20 of the instant application and thus anticipate the claims of the instant application. Claims of the instant application therefore are not patently distinct from the earlier patent claims and as such are unpatentable over obvious-type double patenting. A later application claim is not patentably distinct from an earlier claim if the later claim is anticipated by the earlier claim.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

"A later patent claim is not patentably distinct from an earlier patent claim if the later claim is obvious over, or **anticipated by**, the earlier claim. In re Longi, 759 F.2d at 896, 225 USPQ at 651 (affirming a holding of obviousness type double patenting because the claims at issue were obvious over claims in four prior art patents); In re Berg, 140 F.3d at 1437, 46 USPQ2d at 1233 (Fed. Cir. 1998) (affirming a holding of obviousness-type double patenting where a patent application claim to a genus is anticipated by a patent claim to a species within that genus). " ELI LILLY AND COMPANY v BARB LABORATORIES, INC., United States Court of Appeals for the Federal Circuit, ON PETITION FOR REHEARING EN BANC (DECIDED: May 30, 2001).

"Claim 12 and Claim 13 are generic to the species of invention covered by claim 3 of the patent. Thus, the generic invention is **"anticipated"** by the species of the patented invention. Cf., Titanium Metals Corp. v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (holding that an earlier species disclosure in the prior art defeats any generic claim) 4 . This court's predecessor has held that, without a terminal disclaimer, the species claims preclude issuance of the generic application. In re Van Ornum, 686 F.2d 937, 944, 214 USPQ 761, 767 (CCPA 1982); Schneller, 397 F.2d at 354. Accordingly, absent a terminal disclaimer, claims 12 and 13 were properly rejected under the doctrine of obviousness type double patenting." (In re Goodman (CA FC) 29 USPQ2d 2010 (12/3/1993).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a. U.S. Patent No. 6,587,070 to Hallse discloses a digital base-10 logarithm converter.

b. U.S. Patent No. 5,539,682 to Jain et al. disclose a seed generation technique for iterative, convergent digital computations.

c. U.S. Patent No. 5,365,465 to Larson discloses a floating point to logarithm converter.

d. U.S. Patent No. 6,587,863 to Gentile et al. disclose a multiphase, interleaved direct digital synthesis methods and structures.

e. U.S. Patent No. 4,282,578 to Payne et al. disclose a system for linearizing non-linear transducer signals.

f. U.S. Patent No. 4,482,974 to Kovalick discloses an apparatus and method of phase-to-amplitude conversion in a sine function generator.

g. U.S. Patent No. 5,942,992 to Kelly discloses a fast technique for converting binary numbers into values expressed in an engineering unit format.

h. U.S. Patent No. 5,379,239 to Nakatani discloses a waveform display device.

i. U.S. Patent No. 2002/0161949 to Rzyski discloses a data transmission by an alternating frequency analog signal.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2193

January 23, 2007